ALFALFA HAY FOR HORSES

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THE FOUR C'S

Horse owners frequently mention **cleanliness, color and cutting** when it comes to choosing hay. Cleanliness should be the most important factor in selecting horse hay. Hay that contains dust or mold can inflame the respiratory tract. It is also possible for hay mold to affect other systems in the horse such as the digestive system and liver. Some horses suffer from a chronic respiratory condition that seriously impairs their ability to breathe normally. This condition, commonly known as heaves, worsens when horses are fed moldy or dusty hay. Horses with heaves are exercise intolerant and thus have little value except as pets, or possibly as breeding animals.

Color and cutting are often mentioned by horse owners as being important, but there are many misconceptions about these two characteristics. Most horse owners want hay that is green in color. Horse owners often believe that a bright green color is associated with a fresh product that is high in nutritional value. Similarly, a yellowish or bleached appearance is discriminated against. Horse owners must be educated to look beyond the exterior of the bale; sometimes the exterior of the bale with have a bleached appearance while the inside of the bale is quite green. In addition, it is possible for hay on the outside of the bale to be very green, while the hay on the inside is gray and moldy. One of the most common questions asked by new horse owners regards the best cutting to buy. In many cases, the best cutting will vary from year to year and from producer to producer. In Central Kentucky, first cutting alfalfa is often of relatively low quality because weather conditions usually prohibit cutting and baling at optimum times. However, in 1999, extremely dry conditions resulted in fairly good quality first cutting hay and essentially no second or third cuttings. Horse owners must learn to avoid conclusions based on cutting and instead evaluate hay based on its cleanliness, color and nutrient content.

The fourth "C" is **convenience.** Many horses are kept by individuals for recreation or as a hobby. Horse keeping chores are often performed in the morning and evening, before and after work. Consequently, many horse owners prefer feeds that simplify their chores and select against feeds that have some inconvenient feature. For example, large heavy bales are difficult for some horse owners to handle and bales with wire are harder to open than bales with twine. Round bales are not useful in stables where horses are fed individually. Instead, horse owners prefer smaller rectangular bales that can be easily divided into individual portions. Even when

groups of horses are fed in pastures, round bales that have been stored outside are usually too moldy to feed safely. Round bales that have been stored in a protected area can be used for feeding horses in pastures if there are enough horses in a pasture to consume the bale within a few days. Round bales that remain in a pasture for more than a few days will probably start to develop some mold, unless the weather conditions are dry.

Nutritional Value

Alfalfa almost always offers more nutrients per pound than any other hay fed to horses (Table 1). In addition, it is highly palatable so wastage is often less than with other hays. Alfalfa hay is second only to good quality, vegetative pasture in terms of nutrient value and palatability. Clean, dust free alfalfa can be a useful hay for horses if it is fed with an understanding of its nutrient value and nutrient needs of various types of horses.

Table 1. Nutrient Composition of Forages Fed to Horses (100% Dry matter basis)

Type of Forage	Digestible Energy/lb	% Crude Protein	% Calcium
Midbloom Alfalfa Hay	1.1 Mcal/lb	18-19%	1.3%
Midbloom Timothy Hay	.9 Mcal/lb	9-10%	.40%
Blue grass/white clover pasture	1.2 Mcal/lb	19-29%	.55%

Because alfalfa is high in energy, protein and calcium, it is a useful feed in rations for growing horses and broodmares. In 1997, two studies examined the use of alfalfa in rations with growing horses. Wall and colleagues (1997) studied 16 Quarter Horse yearling fillies. The fillies were divided into two groups. One group received alfalfa hay and a low protein concentrate containing mostly corn and a mineral supplement. The other group received Bermuda grass hay and a high protein concentrate containing corn, soybean meal and a mineral supplement. The yearlings received these diets for 4 months. During the study, no differences were noted in physical growth measurements of the horses. Coleman and coworkers (1997) used weanling horses and had similar results. In their study, the weanlings received alfalfa cubes with a control concentrate (12% crude protein); a medium protein concentrate (15% crude protein) and a high protein concentrate (19% crude protein). The study lasted for 4.5 months. Average daily gain was the same for all three groups. As with the study by Wall et al (1997) these data show that when alfalfa hay is fed, the amount of protein in the concentrate needed for growth can be reduced.

One of the disadvantages of feeding alfalfa hay to young horses is the high level of calcium and the wide calcium:phosphorus ratio. When alfalfa hay is used for growing horses, it is essential to balance the ration to provide adequate phosphorus. Even when adequate phosphorus is provided in the diet to meet the daily requirement, the calcium:phosphorus ratio may still exceed the recommended range of 1:1 to 2:1 (grams of calcium to grams of phosphorus). Because of this, some people prefer to use an alfalfa-grass hay for growing horses.

As noted above, alfalfa can be a desirable hay for broodmares. Like the growing horse, gestating mares and lactating mares have increased demand for most nutrients. For the mare, nutrient needs are highest during lactation. If the mare is not fed adequate nutrients to meet the need for lactation, she will use her own body stores. On large commercial breeding farms, it is not uncommon for high quality mares to remain in production for 12 to 15 years. In these situations, underfeeding essential nutrients such as calcium can have long term effects on a mare's well being, To illustrate the importance of quality forage in the diet of lactating mares, table 2 compares the percentage of a 1200 lb mare's energy, protein, calcium and phosphorus requirement that is met by 22 lb of dry matter from timothy hay, midbloom alfalfa hay and blue grass/white clover pasture.

Table 2: Percentage of Requirements of 1200 lactating mare that are met by 22 lb of dry matter from different forages

Type of Forage	% of DE requirement	% of Crude Protein Requirement	% of Calcium Requirement	% of Phosphorus Requirement
Midbloom Alfalfa Hay	78%	115%	213%	85%
Midbloom Timothy Hay	64%	64%	65%	85%
Bluegrass/white clover pasture	85%	160%	90%	85%

Of the three forages listed in Table 2, it is apparent that alfalfa hay and and good quality pasture do the best at meeting the needs of the lactating mare. None of the forages will meet the energy or phosphorus needs of the mare when fed at the rate used in the example (22 lb of dry matter per day) so some concentrate will be necessary. If a horse owner were to feed a concentrate such as oats to meet the energy need, they would need to feed approximately 5 lb with the alfalfa, about 8 lb with the timothy hay and about 4 lb with the pasture. In all cases, the oats would also fulfill the mare's phosphorus requirements, however, when fed with the timothy hay,

there would still be insufficient protein and calcium. Trace mineral requirements of broodmares would not be met by any of the rations described above, so additonal mineral supplementation would also be needed unless a commercially manufactured fortified ration is used instead of oats.

Although alfalfa is an excellent feed for many types of horses, it has some drawbacks for mature horses that are not used for breeding or work. If a mature 1200 lb gelding were fed mid-bloom alfalfa hay, he would require about 16 lb of hay dry matter per day to maintain his body weight. This is a relatively small volume of feed for a mature horse. When horses do not have enough "filler" they may be inclined to chew on fences, trees and barns. On the other hand, if mature horses at maintenance are allowed to eat mid-bloom alfalfa hay to satisfaction, they will probably gain weight. In addition, when mature non-breeding, non-working horses are fed alfalfa hay, their protein requirement will be greatly exceeded. Extra proein does not represent a serious problem to horses with normal kidney function, but it will result in higher urine volumes. If the horses are maintained in stalls, the excess protein in the alfalfa may result in more stall cleaning because of the increased urine production and higher bedding use.

Because of its high nutrient content compared to some other hays, horse owners may consider alfalfa to be too "rich" for their horses. To put this issue in perspective, table 1 shows the nutrient composition of mid-bloom alfalfa hay, mid-maturity timothy hay and blue grass/white clover pasture. Mid-bloom alfalfa is clearly higher in energy and protein value than the timothy hay, but it is actually *lower* in energy and protein value than the pasture. Alfalfa is higher in calcium than both timothy hay and pasture. The pasture values were obtained from a paper published by researchers in Virginia where pastures were sampled during a 12 month period (Wilson et al, 1997). The other values are taken from the National Research Council publication *Nutrient Requirements of Horses.*

Economics

For some horse owners, the perceived well-being of the horse is the primary consideration in selecting hay. For other owners, feed selection is focused on performance enhancement. Still other owners select hay primarily on price. When price is a concern, horse owners will frequently consider only the price of the hay on a per bale or per ton basis. A better economic model considers all of the following: cost of the hay, amount of wasted hay and cost of other feeds needed to make up for nutrients not supplied by the hay. For horses with high nutrient requirements, alfalfa hay can frequently provide an economic benefit to horse owners. For example, if a horse owner owns a lactating mare and alfalfa hay is the same price as timothy hay, the alfalfa has an economic benefit because the mare will need about 35% less grain when she receives alfalfa. Thus, although the monthly cost for hay is the same, the monthly grain bill will be significantly reduced. Alfalfa is typically much more palatable

than other hays, thus horses will waste less. In a study reported in 1999, researchers compared the *ad libitum* dry matter intakes of yearling horses fed alfalfa hay, matua bromegrass hay or coastal bermudagrass hay (LaCasha et al, 1999). On average, the yearlings consumed 24 kg of alfalfa hay, 22 lb of the brome-grass hay and 16 lb of the bermudagrass hay. When horses were given access to all three hays simultaneously, they clearly preferred the alfalfa.

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